Naval Facilities Engineering Command
Engineering and Expeditionary Warfare Center

G-RAM Case Study Cheatham Annex

Presented By
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Naval Facilities Engineering Command
(NAVFAC) MIDLANT

Objective and Agenda

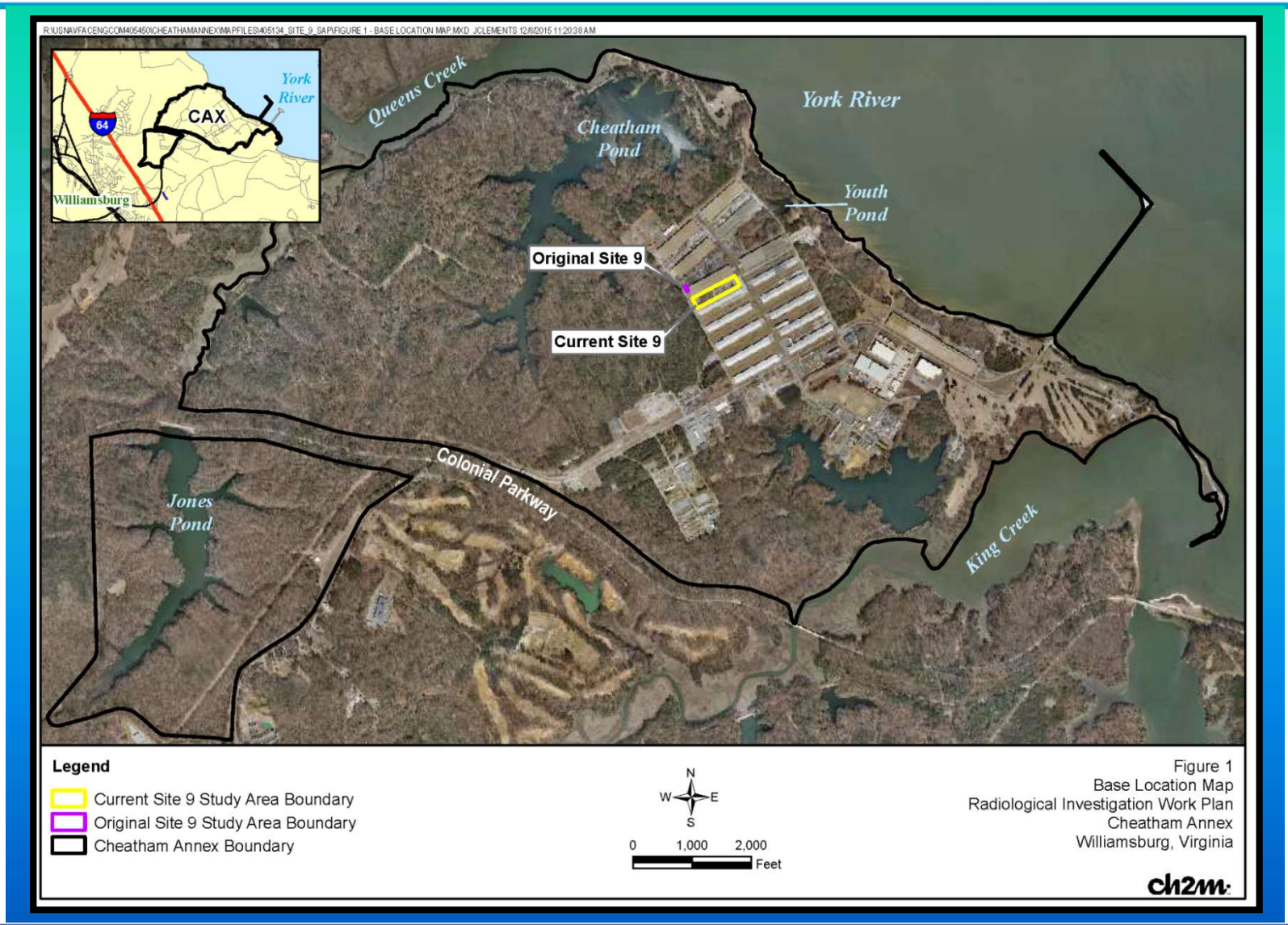
OBJECTIVE:

Provide Case Study to show steps taken to complete RAD investigation.

AGENDA:

- **Case Study of CAX Site 9**
  - **Site history**
  - **G-RAM process**
  - **Overview of items identified**
- **General Conclusions and Take Aways**
- **Knowledge Check**

Case Study – Cheatham Annex (CAX)



Case Study – CAX Site 9

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- **No HRA**
- **Site 9 Initial Assessment Study**

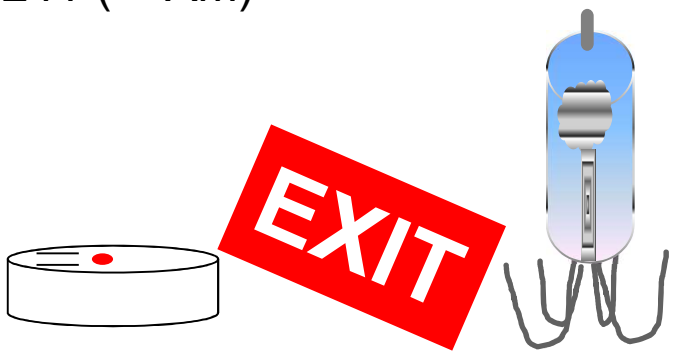
"*Low level radiological items were handled by DPDO (DRMO) and disposed or sold as scrap metal*."

Next Steps:

- **Contact NAVFAC LANT**
- **Contact RASO**
  - Provide site history
  - Meet with RASO (included contractor)
  - Determine contractor with radiological expertise

Case Study – CAX Site 9

- **Radiological Historical Indicators**
  - Use, storage, and disposal of G-RAM at adjacent DRMO facility
  - DRMO crushed material prior to disposal
- **Background surveys**
- **Examples where you might find G-RAM are:**
  - Luminescent paint containing radium-226 (^{226}Ra), strontium-90 (^{90}Sr)
  - Luminescent dials and markers containing ^{226}Ra and ^{90}Sr
  - Electron Tubes/Voltage Regulators/Capacitors containing ^{226}Ra, cesium-137 (^{137}Cs), and cobalt-60 (^{60}Co)
  - Smoke detectors containing americium-241 (^{241}Am)
  - Exit sign containing tritium (^{3}H)



Case Study – CAX Site 9

Site 9 - Planning

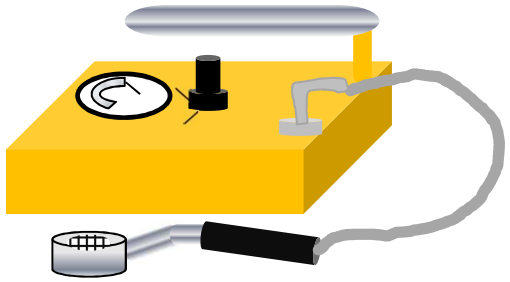
- Gamma radiation walkover scan
- Primary radionuclide of concern – ^{226}Ra and daughter products

Phase 1:

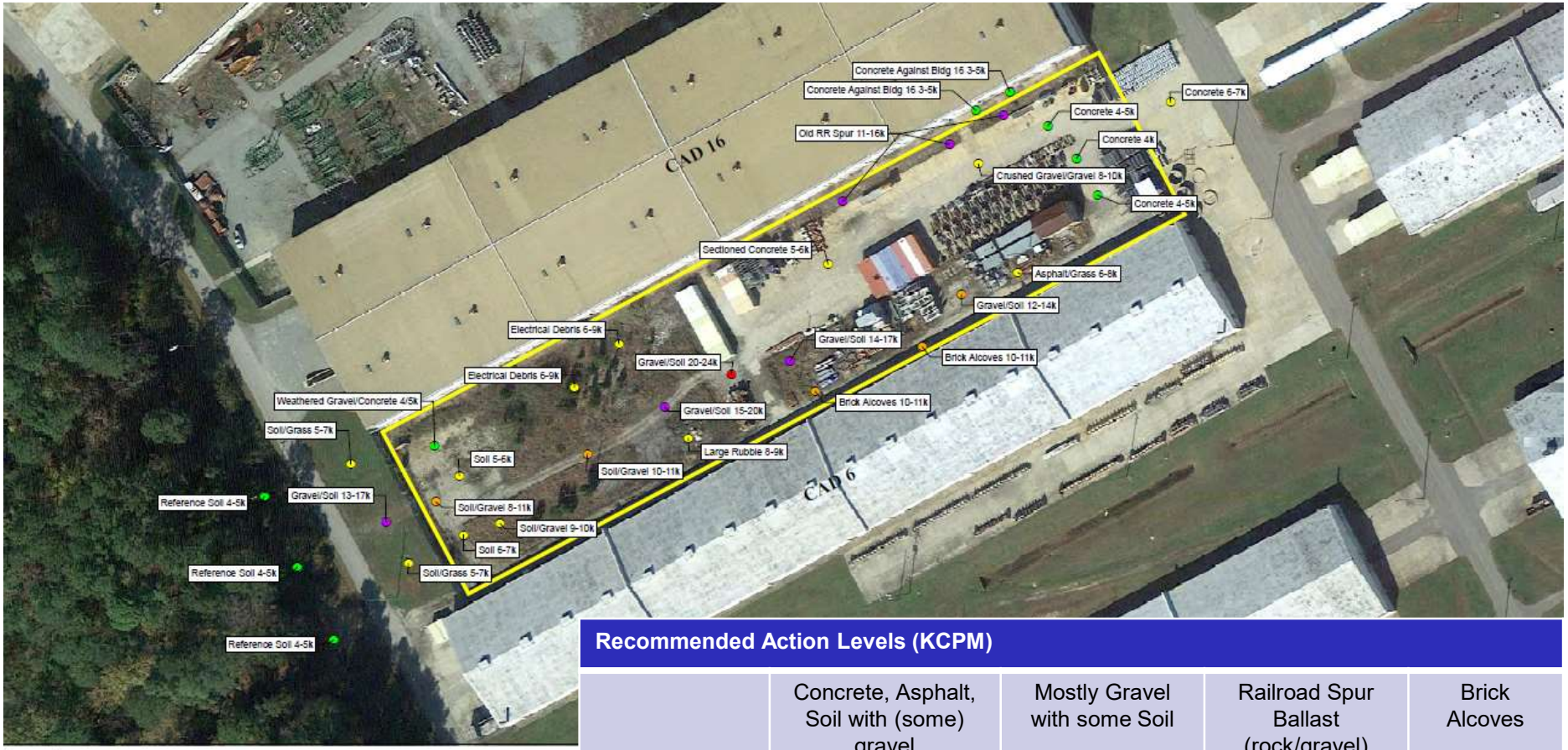
- Compare the gamma scan survey results in counts per minute (cpm) to background survey results

Phase 2:

- Radiological surveys on environmental soil samples collected during field activities



Case Study - CAX Site 9 PKRCNME3



Legend

Gamma Survey Results (CPM)
- 0-5k
- 6-10k
- 11-15k
- 16-20k
- 21-24k

Site 9 Study Area Boundary

Original Site 9 Study Area Boundary

Note: Google Earth imagery, 11/2015.

Recommended Action Levels (KCPM)

	Concrete, Asphalt, Soil with (some) gravel	Mostly Gravel with some Soil	Railroad Spur Ballast (rock/gravel)	Brick Alcoves
Recommended Action Level	**12K cpm**	**25K cpm**	**24K cpm**	**15K cpm**

0 50 100 Feet

ch2m

Slide 8

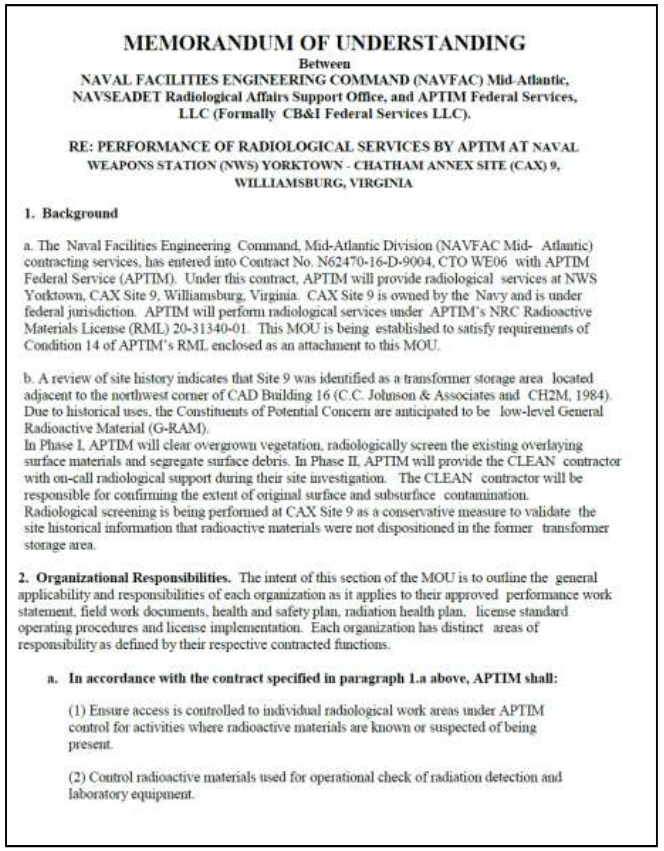
PKRCNME3 Make sure you explain how you and the team came up with the action levels and what the significance is of the surface type versus the RAL.

Parra, Krista R CIV NAVFAC MIDLANT, EV, 12/21/2017

Case Study – CAX Site 9

Site 9 – Documents

- MOU between contractor and contracting officer
- G-RAM Work Plan
- G-RAM Surface Scan and
- ESI UFP-SAP Work Plan



MEMORANDUM OF UNDERSTANDING

Between
NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC) Mid-Atlantic, NAVSEADET Radiological Affairs Support Office, and APTIM Federal Services, LLC (Formally CB&I Federal Services LLC).

RE: PERFORMANCE OF RADIOLOGICAL SERVICES BY APTIM AT NAVAL WEAPONS STATION (NWS) YORKTOWN - CHATHAM ANNEX SITE (CAX) 9, WILLIAMSBURG, VIRGINIA

1. Background

a. The Naval Facilities Engineering Command, Mid-Atlantic Division (NAVFAC Mid- Atlantic) contracting services, has entered into Contract No. N62470-16-D-9004, CTO WE06 with APTIM Federal Service (APTIM). Under this contract, APTIM will provide radiological services at NWS Yorktown, CAX Site 9, Williamsburg, Virginia. CAX Site 9 is owned by the Navy and is under federal jurisdiction. APTIM will perform radiological services under APTIM's NRC Radioactive Materials License (RML) 20-31340-01. This MOU is being established to satisfy requirements of Condition 14 of APTIM's RML enclosed as an attachment to this MOU.

b. A review of site history indicates that Site 9 was identified as a transformer storage area located adjacent to the northwest corner of CAD Building 16 (C.C. Johnson & Associates and CH2M, 1984). Due to historical uses, the Constituents of Potential Concern are anticipated to be low-level General Radioactive Material (G-RAM).
In Phase I, APTIM will clear overgrown vegetation, radiologically screen the existing overlaying surface materials and segregate surface debris. In Phase II, APTIM will provide the CLEAN contractor with on-call radiological support during their site investigation. The CLEAN contractor will be responsible for confirming the extent of original surface and subsurface contamination.
Radiological screening is being performed at CAX Site 9 as a conservative measure to validate the site historical information that radioactive materials were not dispositioned in the former transformer storage area.

2. Organizational Responsibilities. The intent of this section of the MOU is to outline the general applicability and responsibilities of each organization as it applies to their approved performance work statement, field work documents, health and safety plan, radiation health plan, license standard operating procedures and license implementation. Each organization has distinct areas of responsibility as defined by their respective contracted functions.

a. In accordance with the contract specified in paragraph 1.a above, APTIM shall:

(1) Ensure access is controlled to individual radiological work areas under APTIM control for activities where radioactive materials are known or suspected of being present.

(2) Control radioactive materials used for operational check of radiation detection and laboratory equipment.

Case Study – CAX Site 9

Case Study - CAX Site 9

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Summary of items identified:

- **32 G-RAM items identified to date**
  - Smoke detectors
  - Wire
  - Switch
  - Check sources
  - Ceramic items
  - Counter weights

- **Isotopes identified**
  - ^{226}Ra
  - ^{137}Cs
  - ^{241}Am

RAD Check Source

Counter weight

Case Study – CAX Site 9

Next steps

- Complete Phase 1 and 2 activities
- Remove Low Level Radiological Waste (LLRW) from the site
- Determine if analytical radiological sampling is warranted in the RI investigation

Conclusions and Takeaways

- **Engage with RASO early in process to avoid delays**
  - Request an RASO Environmental Protection Manager (EPM) assignment upfront
  - Emphasize schedule and schedule drivers
  - Distinguish required review times from RASO
  - Request RASO support for regulatory discussions (if warranted)
- **Involve management and installation leadership and keep all POCs informed of progress**
- **Reach out for tips/templates**
  - Radiological Workgroup members
  - NAVFAC LANT
  - Other RPMs
- **Document, document, document!**
  - If available, have RASO complete a site visit and stay involved during field work activities
  - Calibrate instruments frequently throughout work day

Knowledge Check

- **What conceptual site model information would lead an RPM to question if G-RAM was a concern during the initial planning stages of a project?**

  Disposal site, landfill, radium paint shop, DRMO

- **What are the common radionuclides that might be found at naval facilities?**

  Radium-226, Thorium-232, Cesium-137, Strontium-90

- **Before information is released outside of the Navy team who needs to be contacted to approve and coordinate the information and how it is shared?**

  RASO and the appropriate Public Affairs Officers

Contacts and Questions

Points of Contact

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- Angela.jones1@navy.mil

Questions ?